Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_

**Macromolecules Picture Assignment**

Ms. OK, AP Biology

**Directions:**You and your teammates will find images of the molecules listed below using Google image and/or other websites. Copy and paste the images into the table below. Identify whether the picture is an example of a monomer or polymer and the specific name of the molecule pictured. Identify the type of macromolecule shown in the picture—carbohydrate, lipid, protein, or nucleic acid and explain your choice. Your explanation might include information about the elements present (and their relative amounts), the components / parts of the molecule, and/or the overall shape of the molecule. When you are finished, save your document to the computer, and email the document as an attachment to [ottolike@pwcs.edu](mailto:ottolike@pwcs.edu) .

*Note: You may not use any images from the notes.*

**List of Molecules:** a monosaccharide (in ring form), a monosaccharide (in straight chain form), a disaccharide, a polysaccharide, a glycerol, a fatty acid chain, a phospholipid, a triglyceride (aka fat), an amino acid, a polypeptide, a nucleotide, DNA, RNA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Picture** | **Specific Name of Molecule** | **Monomer or Polymer?** | **Type of Macromolecule (Carb, Lipid, Protein, or Nucleic Acid)** | **Explanation for Type of Macromolecule** |
| http://upload.wikimedia.org/wikipedia/commons/thumb/6/67/Beta-D-Fructofuranose.svg/230px-Beta-D-Fructofuranose.svg.png | Monosaccharide  (In ring form) | Monomer | Carbohydrate | Has Carbon, Hydrogen, Oxygen  These molecules have carbon atoms joined in a ring with hydroxyl groups branching off |
|  | monosaccharide (in ring form) | Monomer | Carbohydrate | They typically contain five or six carbon atoms joined in a ring with OH branching off. |
|  | Monosaccharide (in straight chain form) | Monomer: Glucose | Carbohydrate | C6, H12, O6 |
| http://www.wikidoc.org/images/8/8d/D-glucose_color_coded.png | Monosaccharide  (In straight chain form) | Monomer | Carb | Carbon, Hydrogen, Oxygen  The carbons are shown un joined in a straight chain |
| http://upload.wikimedia.org/wikipedia/commons/thumb/c/ce/Chitobiose.svg/2000px-Chitobiose.svg.png | disaccharide | Dimer (two monomers joined together) | Carbohydrate | They are two monosaccharide’s put together. |
|  | Disaccharide | Polymer:  Sucrose | Carbohydrate | It is Glucose and Fructose joined together through covalent bonds and dehydration synthesis |
|  | a polysaccharide | Polymer | Carbohydrate | This is a polysaccharide because it is a bunch of glucose monomers linked together in one molecule. |
|  | polysaccharide | Polymer | Carb | Composed of glucose, a monosaccharide |
| https://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb1/part2/images/glycer3.gif | glycerol | Monomer | Lipid | It has three carbon molecules with hydroxyl groups branching off. |
| http://upload.wikimedia.org/wikipedia/commons/thumb/8/8d/Sn-Glycerol.png/376px-Sn-Glycerol.png | Glycerol | Monomer | Lipid | Carbon, Hydrogen, few Oxygen  Small three carbon molecule with hydroxyl groups |
|  | Fatty acid chain | Monomer | Lipid | Many C’s and H’s |
|  | Fatty Acid Chain | Monomer | Lipid | Long chain of carbon atoms linked together and surrounded by hydrogen atoms |
|  | phospholipid | polymer | lipid | A phospholipid is composed of two unsaturated fatty acid chains / tails connected to a polar “head” group (choline, a phosphate group, and glycerol) |
|  | a phospholipid | Polymer | Lipid | This is considered to be a lipid polymer because the glycerol is bonded to the fatty acid chains to form a phospholipid. It also only has two tails. |
| http://www.bodyrecomposition.com/wp-content/uploads/2009/05/triglyceride.gif | Triglyceride  (aka fat) | Polymer | Lipid | Glycerol molecule bonded to three fatty acid chains |
| http://www.indiana.edu/~oso/Fat/FatImg/triglyceride.jpg | Triglyceride (aka fat) | Polymer | Lipid | Single glycerol molecule bonded to three fatty acid chains |
| https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRGX0jzDmGhfUtYCHkbejlJszaXtigcXqo2lHx0I2rXrqxnghPdrQ | an amino acid | Monomer | Protein | An amino acid is considered a monomer of a protein because it is a building block for proteins. An amino acid is comprised of an amino group, carboxyl group, and R branch centered around a central carbon. |
| http://upload.wikimedia.org/wikipedia/commons/thumb/c/ce/AminoAcidball.svg/2000px-AminoAcidball.svg.png | Amino Acid | Monomer | Protein | They have a central carbon atom surrounded by a hydrogen atom, carboxyl group, amino group, and R group. |
| http://images.tutorvista.com/cms/images/81/polypeptide.png | Polypeptide | Polymer | Protein | Carboxyl group of one amino acid bonds to the amino group of another amino acid through dehydration and synthesis |
|  | a polypeptide | Polymer | Protein | A polypeptide is comprised of amino acids that are bonded by dehydration synthesis where it loses water and forms a peptide bond. |
| http://2.bp.blogspot.com/-xPuNVM4cKX8/UWnyfXlVm2I/AAAAAAAAAGM/XsOazwduK9I/s1600/three+parts+of+nucleotide.jpg | a nucleotide | Monomer | Nucleic Acid | This is a nucleotide because of the presence of a phosphate group, 5 carbon sugar, and nitrogenous base. |
|  | Nucleotide | Monomer | Nucleic Acid | Composed of three parts: phosphate group bonded to a 5 carbon sugar and a Nitrogen base |
| https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcSZKKiKCUC7cwhnHSLYXshUB9DUwMMM0BKMNRJhhfiqu-e6vRMQAg | DNA | Polymer | Nucleic Acid | Made of two strands of nucleotides wound together in a double helix structure |
|  | DNA | Polymer | Nucleic Acid | This is a DNA molecule because it has a double helix comprise of nucleotides that have nitrogenous base pairs making up the rungs. |
|  | RNA | Polymer | Nucleic Acid | One strand of nucleotides  Uracil takes the place of Thymine, which is a base in DNA |
|  | RNA | Polymer | Nucleic Acid | Single strand of nucleotides that contains uracil and ribose |